Complete Summary

GUIDELINE TITLE

Joslin Diabetes Center & Joslin Clinic clinical nutrition guideline for overweight and obese adults with type 2 diabetes, prediabetes or those at high risk for developing type 2 diabetes.

BIBLIOGRAPHIC SOURCE(S)

Joslin Diabetes Center & Joslin Clinic clinical nutrition guideline for overweight and obese adults with type 2 diabetes, prediabetes or those at high risk for developing type 2 diabetes. Boston (MA): Joslin Diabetes Center; 2005 Sep 30. 6 p. [61 references]

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Type 2 diabetes and prediabetes
- Overweight and obesity

GUIDELINE CATEGORY

Management
Prevention

CLINICAL SPECIALTY

Endocrinology
Family Practice
Internal Medicine
Nutrition
Preventive Medicine

INTENDED USERS

Dietitians
Health Care Providers
Physicians

GUIDELINE OBJECTIVE(S)

- To support clinical practice and to influence clinical behaviors in order to improve clinical outcomes and assure that patient expectations are reasonable and informed
- To assist primary care physicians, specialists, and other healthcare providers in individualizing the care of and set goals for adult, non-pregnant patients with type 2 diabetes or individuals at high risk for developing type 2 diabetes

TARGET POPULATION

- Non-pregnant, overweight or obese* adults with type 2 diabetes or prediabetes
- Individuals at high risk for developing type 2 diabetes

*Body mass index (BMI) >25 kg/m^2 or waistline >40"/102 cm (men), >35"/88 cm (women). For Asian populations (South Asian Indians, East Asians and Malays) a BMI >23 kg/m^2 and a waistline >35"/90 cm in men or >31"/80 cm in women is considered.

INTERVENTIONS AND PRACTICES CONSIDERED

Gradual weight reduction based on individualized balanced meal plan of carbohydrate, protein, and fat; physical activity and behavioral modification; and weight management medications (if indicated)

MAJOR OUTCOMES CONSIDERED

Not stated

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

1. Indicates strong scientific evidence to support this recommendation
2. Indicates some scientific evidence to support this recommendation
3. Indicates limited scientific evidence to support this recommendation
4. Indicates no available evidence but clinical experience and expert consensus support this recommendation

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Guidelines are developed and approved through the Clinical Oversight Committee that reports to the Chief Medical Officer of the Joslin Diabetes Center, Joslin Clinic Inc. This guideline was approved by the Joslin Clinical Oversight Committee on 9/30/05.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Strength of scientific evidence (1-4) definitions are provided at the end of the "Major Recommendations" field.

<table>
<tr><th colspan="6">Target Individuals and General Goals of Clinical Nutrition Guideline</th></tr>
<tr><td rowspan="6">Target Population</td><td>Body Mass Index (BMI)</td><td>> 25 kg/m^2</td><td></td><td>Type 2 Diabetes

or</td><td></td></tr>
<tr><td></td><td></td><td>and</td><td></td><td></td></tr>
<tr><td>or Waistline</td><td>> 40"/102 cm (men)
> 35"/88 cm (women)</td><td></td><td>Prediabetes</td><td>Impaired glucose tolerance (IGT)
Impaired fasting glucose (IFG)</td></tr>
<tr><td></td><td></td><td></td><td>or</td><td></td></tr>
<tr><td></td><td></td><td></td><td>High Risk for Type 2 diabetes</td><td>The Metabolic Syndrome (ATP III Criteria)
Family history of type 2 diabetes mellitus (DM) (first degree relative)
Confirmed diagnosis of insulin resistance (e.g., high basal insulin)</td></tr>
<tr><td colspan="5">For Asian populations (South Asian Indians, East Asians and Malays) a BMI >23 kg/m^2 and a waistline >35"/90 cm in men or >31"/80 cm in women is considered.</td></tr>
<tr><td>Goals</td><td colspan="5">1. To improve overall metabolic control while achieving gradual weight reduction and maintaining achieved weight loss
2. To improve fasting and postprandial hyperglycemia in order to prevent or reduce diabetes complications.
3. To improve fasting and postprandial hypertriglyceridemia as a major lipid abnormality in the target population
4. To improve lipid profile including increase of high-density lipoprotein (HDL)-cholesterol and decrease of low-density lipoprotein (LDL)-cholesterol
5. To improve insulin sensitivity as a major precursor of type 2 diabetes
6. To improve body fat distribution and to reduce visceral fat</td></tr>
</table>

Target Individuals and General Goals of Clinical Nutrition Guideline	
	burden 7. To reduce cardiovascular risk as evidenced by improvement of endothelial function and endothelial markers 8. To reduce inflammatory cytokines, and markers of inflammation and increased coagulation 9. To improve blood pressure as a contributing risk factor for cardiovascular and renal complications 10. To enhance thermogenesis and maintain lean body mass 11. To provide a balanced meal plan of carbohydrate, protein, and fat 12. To improve overall health through increased physical activity 13. To prevent and treat the chronic complications of diabetes
General Guidelines	
1. Consideration of recent consistent and strong evidence that weight reduction improves insulin sensitivity and glycemic control in type 2 diabetes and decreases the risk of developing type 2 diabetes in prediabetes and high-risk populations. ***Weight reduction*** should be considered one of the prime objectives of any nutrition recommendations suggested to the target population. *(Strength of evidence 1)* 2. Any meal plan modifications should first be discussed with a ***Registered Dietitian (RD)*** or a qualified healthcare provider. *(Strength of evidence 4)* 3. Target individuals should meet with an ***RD*** for assessment and review of medical management and treatment goals to select approach for medical nutrition therapy. *(Strength of evidence 2)* 4. The diet composition, described below, is for general guidance only and may be individualized by the RD or the healthcare provider according to clinical judgment. (See Appendix A in the original guideline document). 5. Meal plans do not need to include between-meal or evening snacks. *(Strength of evidence 4)* 6. Meal-to-meal consistency in carbohydrate is of primary importance to patients with fixed medication/insulin programs. *(Strength of evidence 4)*	
Weight Reduction	
	1. A structured lifestyle plan that combines dietary modification and exercise is necessary for weight reduction. 2. A modest and gradual weight reduction of one pound every one to two weeks should be the optimal target. *(Strength of evidence 2)* 3. Reduction of daily caloric intake should be by 250 to 500 calories. *(Strength of evidence 4)* Total daily caloric intake should not be less than 1000 to 1200 for women and 1200 to 1600 for men, or based on an RD assessment of usual intake. *(Strength of evidence 4)* 4. Weight reduction should be individualized and continued until BMI reaches the normal range (18.5 to 25 kg/m^2) or until an agreed upon BMI goal is reached. 5. Target individuals should meet with RD to learn and practice portion control as an effective way of weight control.

Target Individuals and General Goals of Clinical Nutrition Guideline		
	(Strength of evidence 4) 6. Meal replacements (MR) in the form of shakes, bars, ready-to-mix powders, and pre-packaged meals that match these nutrition guidelines are helpful for <u>some</u> patients *(Strength of evidence 2)*. Blood glucose patterns frequently change with the initiation of meal replacements, and diabetes medications may need adjustment. Patients should be told to monitor their blood glucose carefully to identify hypoglycemia. *(Strength of evidence 2)* 7. U.S. Food and Drug Administration (FDA)-approved weight management medications should be prescribed, if indicated. Approved medications are an adjunct to dietary and lifestyle changes (*Strength of evidence 2)*. 8. Bariatric surgeries are effective options and should be encouraged when indicated (consider in individuals with BMI >40 kg/m^2 and those with BMI >35 kg/m^2 with other comorbidities). *(Strength of evidence 2)*	
Macronutrient Composition		
Carbohydrate	***Percentage***	~40% of total caloric intake. *(Strength of evidence 2)* The total should not be less than 130 g/day. *(Strength of evidence 2)*
	Glycemic Index and Glycemic	Reduction of the quality (Glycemic Index [GI]) and quantity (Glycemic Load [GL]) of carbohydrate choices is essential for blood glucose control. The GI/GL concept is an important factor that patients should apply in their daily selection of carbohydrates foods. Foods with a low glycemic index should be selected (e.g., cereals based on oats and barley, legumes, fruits, green salad with olive oil-based dressing, and vegetables, except potatoes)
	Recommended ***Not recommended***	Vegetables and fruits (preferably fresh), legumes, whole and minimally processed grains Refined carbohydrates or processed grains and starchy foods especially pasta, white bread, low-fiber cereal, and white potatoes should be consumed in very limited quantities (e.g., pasta ~2 oz.) *(Strength of evidence 1)*
	Fiber	A minimum of 20 to 35 g of fiber per day is recommended. *(Strength of evidence 1)* If tolerated, ~50 g/day is effective in improving postprandial hyperglycemia and should be encouraged. *(Strength of evidence 2)* Fiber from unprocessed food, such as fresh vegetables and fruits, is preferable but, if needed, fiber supplements such as psyllium and beta-glucan can be added. *(Strength of evidence 3)*
Fat	***Percentage***	~30 to 35% of total caloric intake; *(Strength of*

Target Individuals and General Goals of Clinical Nutrition Guideline		
		evidence 2) saturated fat should be limited to <10% of total caloric intake or <7% in individuals with LDL-cholesterol >100 mg/dL. *(Strength of evidence 1)* Polyunsaturated fat should comprise up to 10% of total calories, and monounsaturated fat up to 15 to 20% of total calories.
	Recommended ***Not recommended***	Mono- and polyunsaturated fats (e.g., olive oil, canola oil, nuts/seeds, and fish, particularly those high in omega-3 fatty acids). Oily fish (e.g., salmon, herring, trout, sardines, fresh tuna) 2 times/week is an ample source of omega-3 fatty acids. Foods high in saturated fat, including beef, pork, lamb, and high-fat dairy products (e.g., cream cheese, whole milk, or yogurt) should be consumed only in small amounts. Foods high in trans-fats (e.g., fast foods, commercially baked goods, some margarines) should be avoided. *(Strength of evidence 1)*
	Cholesterol	<300 mg/day or <200 mg/day in individuals with LDL-cholesterol >100 mg/dL. *(Strength of evidence 4)* Egg yolks should be limited to 2 to 3 per week; other foods high in dietary cholesterol, such as red meat, whole-fat dairy foods, shellfish, and organ meats should be limited, as well.
Protein	***Percentage***	~20 to 30% of total caloric intake. *(Strength of evidence 2)*
	Favorable Protein	Fish, skinless poultry, nonfat or low-fat dairy, legumes, tofu, tempeh, and seitan. It is not recommended to *increase* protein from high saturated fat animal sources (e.g., beef, pork, lamb and high-fat dairy products), as it may be associated with increased cardiovascular risk. *(Strength of evidence 2)* Emerging data suggest that protein aids in the sensation of fullness and that low-protein meal plans are associated with increased hunger. Thus, lean protein together with healthy fats may serve to reduce appetite and assist patients in achieving and maintaining a lower calorie level. *(Strength of evidence 1)* Protein also helps to maintain lean body mass during weight reduction. *(Strength of evidence 2)*
	Patients with Renal Issues	Although reducing total calories may result in a reduction of the absolute total amount of protein intake, any patient with signs of kidney disease (i.e., one or more of the following: albuminuria, proteinuria, creatinine clearance <60 mL/min)

Target Individuals and General Goals of Clinical Nutrition Guideline		
		should consult a nephrologist before increasing total or percentage protein in their diet. *(Strength of evidence 2)* Protein intake for these patients should be modified, but not lowered to a level which may jeopardize their overall health or increase their risk for malnutrition. *(Strength of evidence 4)*
Physical Activity and Behavioral Modification		
1. Physical activity, behavior modification, and good support systems are extremely important and should be included in the nutrition prescription described above. Increased physical activity, in particular, should be an integral component of any weight reduction plan to maximize the benefits of weight reduction on diabetes control and to prevent coronary and cerebral vascular disease. *(Strength of evidence 1)* 2. A minimum of 150 to 175 minutes of moderate intensity physical activity/week should be achieved unless contraindicated. *(Strength of evidence 1)* A target of 60 to 90 minutes most days of the week is encouraged. *(Strength of evidence 4)* 3. Exercise should be a mix of cardiovascular, stretching, and resistance exercises to maintain or increase lean body mass. *(Strength of evidence 2)*		

Definitions:

Strength of Scientific Evidence

1. Indicates strong scientific evidence to support this recommendation
2. Indicates some scientific evidence to support this recommendation
3. Indicates limited scientific evidence to support this recommendation
4. Indicates no available evidence but clinical experience and expert consensus support this recommendation

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for selected recommendations (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate individualized nutritional management of overweight and obese adults with type 2 diabetes and prediabetes resulting in gradual weight reduction, improved metabolic control, improved postprandial hyperglycemia and hypertriglyceridemia, reduced cardiovascular risk, and prevention of diabetes complications

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This guideline focuses on the unique needs of adult, non-pregnant patients with type 2 diabetes or individuals at high risk for developing type 2 diabetes and complements the 2005 Dietary Guidelines for Americans, which is jointly developed by the Department of Health and Human Services and the Department of Agriculture. It is not intended to replace sound medical judgment or clinical decision-making and may need to be adapted for certain patient care situations where more or less stringent interventions are necessary.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2005

GUIDELINE DEVELOPER(S)

Joslin Diabetes Center - Hospital/Medical Center

SOURCE(S) OF FUNDING

Joslin Diabetes Center

GUIDELINE COMMITTEE

Clinical Nutrition Task Force
Joslin Clinical Oversight Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Clinical Nutrition Task Force Members: Osama Hamdy, MD, PhD (*Co-Chairperson*); Cathy Carver, ANP, CDE (*Co-Chairperson*); Richard Beaser, MD; Amy Campbell, MS, RD, CDE; Karen Chalmers, MS, RD, CDE; Chan Cooppan, MD; Om Ganda, MD; Judy Giusti, MS, RD, CDE; Edward S. Horton, MD; Sharon Jackson, MS, RD, CDE; Melinda Maryniuk, MEd, RD, CDE; Robert Stanton, MD; Emmy Suhl, MS, RD, CDE

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the Joslin Diabetes Center.

Print copies: Available from the Joslin Diabetes Center, One Joslin Place, Boston, MA 02215

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on September 22, 2006. The information was verified by the guideline developer on November 3, 2006.

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